DIPARTIMENTO DI INGEGNERIA INDUSTRIALE

BASIS OF ADVANCED REACTOR PHYSICS AND FUEL CYCLE

Abstract: The global quest for clean, secure and economic energy calls for sustainable sources to be massively deployed, altogether concurring to the future scenario. Sustainability is therefore the essential attribute for any such source to be numbered among those part of the solution. Some advanced nuclear energy systems feature a hard neutron spectrum, by which it is possible to achieve the closure of the fuel cycle. Of course, the hardness of the neutron spectrum is not the only feature, even though it is an enabling one. Fast reactors have been built in the past, and are still operational, but none of them is operating in a closed fuel cycle, mostly because it had not been really designed for that. The physics of such reactors, and the connections of this with the physics of the fuel cycle, are to be well captured in designing the core of an advanced reactor which is aimed at the closure of the fuel cycle. Once these connections are mastered, it is possible to conceive a core to operate by design as a burner or breeder, of both plutonium and other (minor) actinides, thereby flexibly responding to any national policy for the optimal management of fuel resources and of waste legacies.

Speaker bio: Eng. Dr. Giacomo Grasso is head of the "Design and technical support for nuclear safety, security and sustainability" laboratory at the Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA).

He is responsible for the coordination of ENEA activities dealing with core design and analysis, fuel cycle analysis and optimization.

He serves as the Italian delegate in several international initiatives and he has lead activities in numerous projects funded by private nuclear engineering companies (e.g. Westinghouse Electric Company Ltd., newcleo s.r.l. and Hydromine Inc.) or by EURATOM collaborative grants.

Eng. Dr. Grasso holds a master degree and a PhD in nuclear engineering, both from the University of Bologna.

Program:

Date: 10th October 9.30-13.30
Where: seminar room, Laboratorio di Montecuccolino, via dei Colli 10, Bologna (Teams link)

Date: 20th October 9.30-13.30
Where: seminar room, Laboratorio di Montecuccolino, via dei Colli 10, Bologna (Teams link)